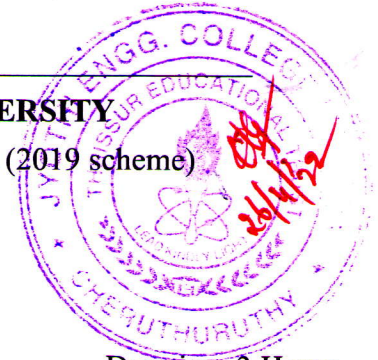


Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Third Semester B.Tech Degree Examination December 2021 (2019 scheme)

**Course Code: ECT205****Course Name: NETWORK THEORY**

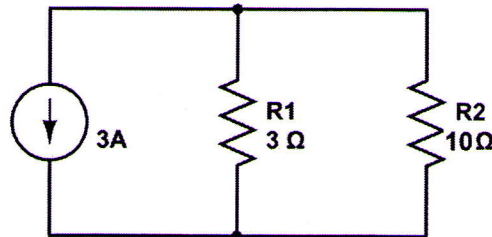
Max. Marks: 100

Duration: 3 Hours

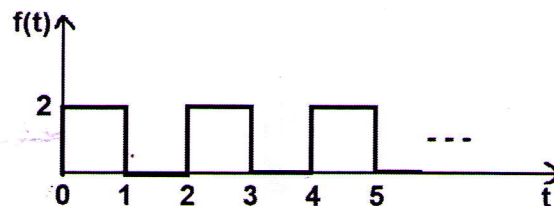
**PART A***Answer all questions. Each question carries 3 marks*

Marks

- 1 Determine the voltage across  $10\Omega$  resistor by applying suitable source transformation. (3)



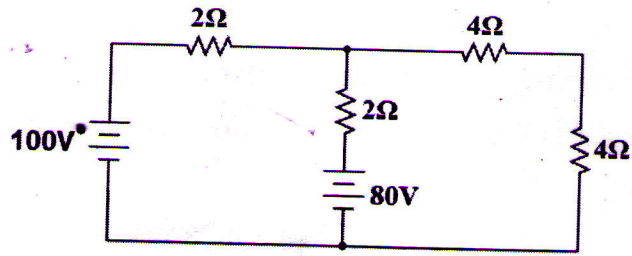
- 2 Explain the different types of sources in electrical network. (3)
- 3 Write the steps for finding the Norton equivalent circuit of a given network having only dependent sources with model equivalent circuit. (3)
- 4 Explain Superposition theorem with the help of an example. (3)
- 5 Obtain the Laplace Transform of the following signal. (3)



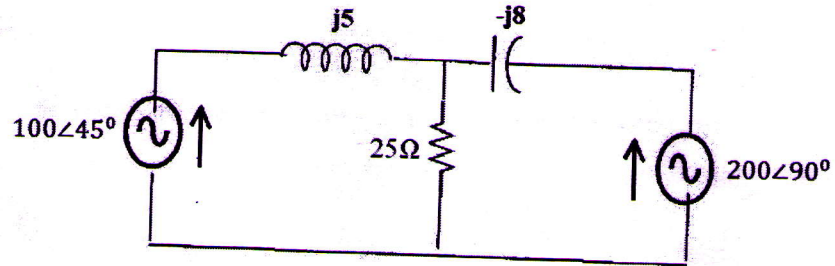
- 6 Derive the time domain response of the RL circuit with step input. (3)
- 7 Describe the significance of poles and zeros of a network function (3)
- 8 Write the necessary conditions for the transfer functions. (3)
- 9 Derive the condition of symmetry and reciprocity in terms of open circuit impedance parameters. (3)
- 10 Deduce open circuit impedance parameters in terms of transmittance parameters. (3)

**PART B***Answer any one full question from each module. Each question carries 14 marks***Module 1**

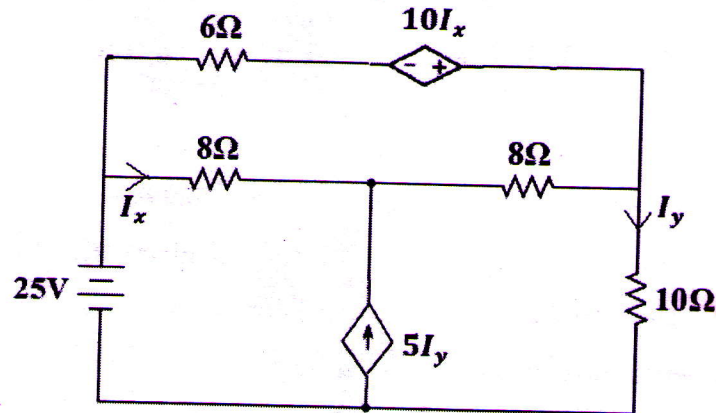
- 11 (a) Find the current through the  $2\Omega$  resistors using mesh analysis (6)



(b) Evaluate the current through  $2\Omega$  resistor using node analysis (8)

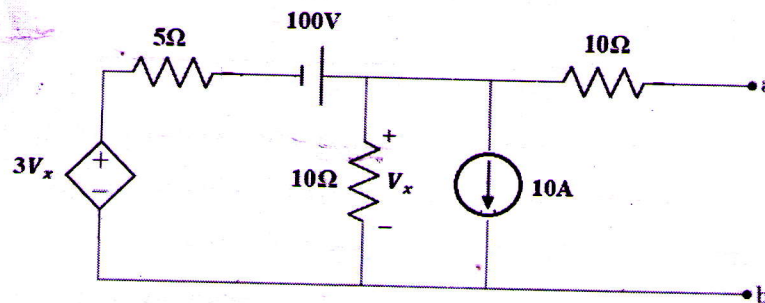


12 Evaluate the voltage across  $10\Omega$  resistor in the following network. (14)

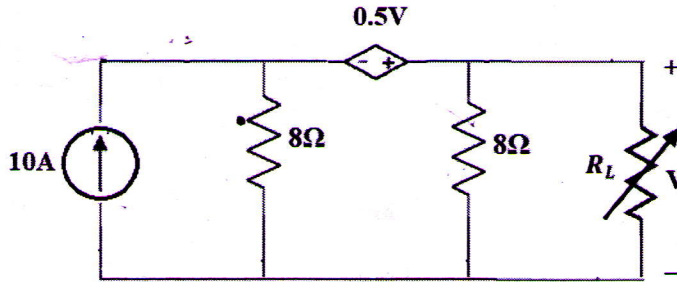


Module 2

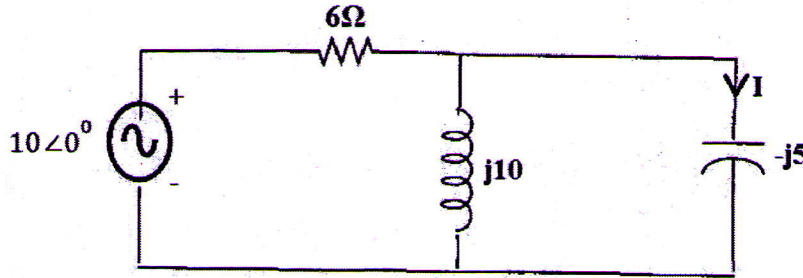
13 (a) Obtain the Thevenin equivalent circuit across the terminal a-b. (8)



(b) Evaluate the value of  $R_L$  for maximum power. Also evaluate the maximum power across the load. (6)



- 14 Evaluate  $I$  and verify Reciprocity theorem for the following network (14)



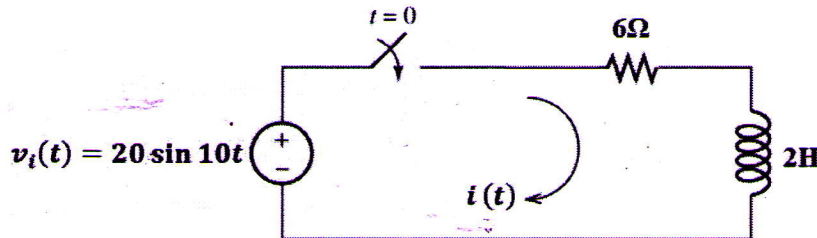
**Module 3**

- 15 (a) Verify initial and final value theorems of Laplace Transform for the following function. (8)

$$f(t) = e^{-t}(t^2 + t^3 + \sin 2t)$$

- (b) Derive the time domain response of an RC network for unit ramp input by assuming the initial condition as zero. (6)

- 16 Evaluate  $i(t)$  in the network for  $v_i(t) = 20 \sin 10t$ . Switch is closed at  $t=0$ . Assume that the initial value of current through the inductor is zero. (14)

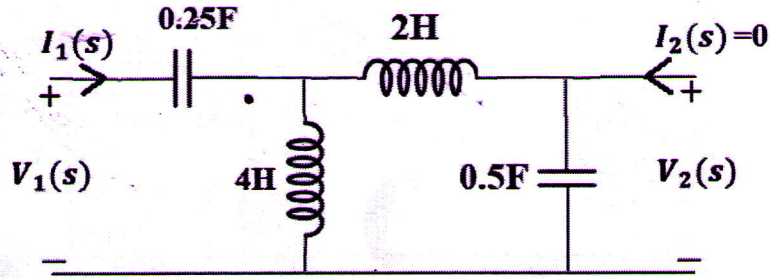


**Module 4**

- 17 Draw the pole zero diagram of the following function and deduce the time domain response from it. (14)

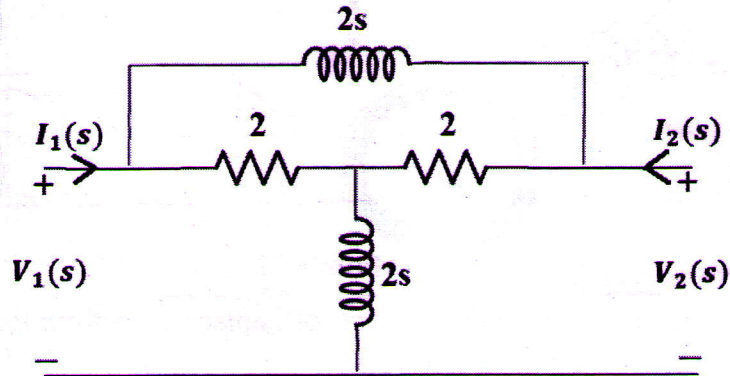
$$V(s) = \frac{(s+3)(s+5)}{s(s+1)(s+4)}$$

- 18 Determine the driving point impedance in the input side of the following network. Also determine voltage gain transfer function. (14)



Module 5

- 19 Determine the Y-parameters of the following network (14)



- 20 Two identical sections of the following network are connected in series-parallel combination. Determine the hybrid parameters (14)

